2011

Implications and recommendations for online physical education at secondary level

Josh Caleb Brannen

IMPLICATIONS AND RECOMMENDATIONS FOR ONLINE PHYSICAL EDUCATION AT SECONDARY LEVEL

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education:

Kinesiology

---

by

Josh Caleb Brannen

June 2011

IMPLICATIONS AND RECOMMENDATIONS FOR ONLINE PHYSICAL EDUCATION AT SECONDARY LEVEL

A Project

Presented to the

Faculty of

California State University,

San Bernardino

---

by

Josh Caleb Brannen

June 2011

Approved by:

[redacted]

Hosung So, First Reader

6/10/2011

Date

[redacted]

Hyun-Kyoung Oh, Second Reader

ABSTRACT

As education budgets become smaller for K-12 secondary education, physical education as a formal class is being threatened at many schools and a demand for online education has resulted in a need for courses that meet the requirements for all subject areas including physical education. The purpose of this project was to examine how online physical education courses impact student learning and achievement of national fitness and health standards. The general problem in online physical education lies in the course content and in the ability to offer student accountability. Research shows that the appropriate combination of engaging learning activities, targeted learning goals and student accountability increases the motivation of students and encourages physical activity in online courses. Included in the recommendations for implementation of a successful online physical education course are the components of activity journals, parental responsibility and monitoring and freedom of choice in activity.

ACKNOWLEDGEMENTS

First of all, I would like to thank the Kinesiology faculty/family at California State University, San Bernardino. The department has helped to educate, mold, guide, support, motivate and inspire me through their genuine caring and instruction.

Special thanks to my fist reader Hosung So and second reader Hyun-Kyoung Oh. These two fine individuals truly understand what it takes to be successful at the highest levels of education and went above and beyond to help me.

I would also like to thank Rick Craig, Raul Gonzalez and then entire recreational sports center staff for their support during my time at Cal State. It will never be forgotten or underappreciated.

I would also like to thank my family and friends. Without their unconditional love and support I don't think any of this would be possible. I would like to thank my daughters Shelby Brannen and Kayla Brannen. I strive everyday to show them how proud I am that I am their father. Finally, I would like to thank my wife, Michelle, for loving and supporting me through all aspects of life. I am blessed to be loved and encouraged by such fine, outstanding people.

TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

Online Education Instruction

Online Education, also known as distance learning, has increased in popularity and availability as the global world has moved further into electronic communication on the internet that allows for instant access and information. As the idea of online education has progressed, it has met the needs of a variety of populations of people including working students and those who don't have the capability of attending school at a regular building. As Mitchell (2009) discusses in her article, "Online Education and Organizational Change", the idea of online education is complicated because it disrupts the traditional frame of curriculum and instruction. The most difficult aspects of the surgence of online education lie in the technological and organizational pieces of a school, whether it is a college or K-12 institution, because the tenets of online education do not fit directly into an existing school structure. The challenges faced by those institutions wishing to implement online education

are not enough to deter the idea from taking hold and becoming a viable alternative for students.

The idea behind online education stem from a constructivist view which implies that student learning should be derived primarily in the belief that a student should be involved in their education and should be a developer of his or her learning style. These methods are highly collaborative and center on discussion of topics and curriculum and are a far cry from a solely lecture driven format (Mitchell, 2009). However well intentioned the constructivist views are regarding the development of online education, the issue of its effectiveness lies in how the quality of education is measured against a more tradition face-to-face format of instruction and assessment. In her study of "Leading Edge Community College" (LECC), she observed online courses through individual interviews, document analysis and site observations. At the conclusion of her study, documented in her article, she asserted that the success of online courses lie in the "academic discipline, the course and the instructor" (Mitchell, 2009, p. 91). These three facets of the course directly impact student engagement and efficacy in regards to work completion and participation in the

activities, discussions and research that each online student would be individually responsible for away from the observation of an in-person instructor. Obviously, there are a number of concerns that can be brought to light when thinking about online education in this way. In many ways the scrutiny regarding the evaluation of the online courses has caused the quality and rigor of these classes to increase changing the ways that instructors and students engage in learning the subject matter (Mitchell, 2009).

The implications for K-12 education are becoming more relevant as more students and instructors find themselves technologically savvy as well as engaged in the internet as a primary form of communication. The idea of online education enables the instructor to delve into a world of differentiated learning that meets the needs of a variety of learning styles and preferences at colleges and universities. The question for our K-12 education becomes one of accountability and differentiation to meet the demands of quality education as well as meeting the demands of a population of students with various and complicated learning styles and needs. Online education for many is becoming the most viable alternative. In the article, "When Technology Bites Back: a Case Report Describing and

Instructor's Experience with Online Teaching", written by Hayward (2003), he discussed the differences between a traditional lecture and online education. He asserted, "when lecture conversation occurs, it is often dominated by a minority of students who feel confident about the subject material and speaking in front of their peers" (p. 48). In contrast, Hayward states that in an online situation an "instructor can increase the number of students who actively participate in the classroom discussion by requiring the use of online features such as discussion boards and virtual chat rooms to complete selected court assignments" (p. 48). As the push for increased rigor, engagement and accountability only increases for K-12 institutions, this venue of online courses seems appropriate to meet the demands of a student population that is filled with different and competing needs for individualized instruction.

In addition, Picciano (2006), discussed two ideas that would be of great interest to K-12 educators—interaction with students and reflective teaching. In an era where educators are in constant search of ways to keep students engaged, it was pointed out that interaction on the message boards and virtual chat rooms that allow for ongoing

threaded conversations between students and the instructor keep instruction and learning happening on a continual basis, often moving into different topics and extending learning beyond the original learning goal by virtue of where the conversations materialize among high levels of student interaction (2006). Additionally, Picciano (2006) would assert that reflective teaching regarding student questions and statements would increase and be a greater level because of the ongoing conversations and interactions with students which would allow for more frequent assessment of student understandings.

As K-12 education funding has seen substantial cuts across the board, the interest in online education has increased. These trends started as early at 2001. For example, in Texas, a charter school organization known as SOUTHWEST Preparatory Charter Schools of San Antonio, Texas began a virtual high school meant to serve underrepresented populations. The high school was discussed in the study, "Fine-tuning an Online High School to Benefit At-Risk Students," by Hurley (2002) where it was clearly discussed how the three areas of focus for the initial year of implementation were attendance, course completion and reliable communication. In their article, "Student Success

in Online K-12 Education, Ronisisvalle and Watkins (2009) discuss that self-regulation, self-efficacy and motivation levels of the students are key components to a successful online education experience. Coupled with that idea, they assert heavily that the construction of the course and the type of material and curriculum contained in the course directly impact the levels of self-regulation, self-efficacy and motivation.

This becomes an important discussion when considering the presence of utilizing online physical education as part of a K-12 program through comprehensive public schools, virtual schools or charter schools. Physical education is being taught online at the secondary school level in a number of states in the United States education system. Twelve states have approved online physical education and six states assert that they are teaching comprehensive online courses based primarily on state and national standards. The question has not yet been answered is whether or not this is the best way for our secondary students to learn physical education? The topic has become a popular discussion piece amongst physical education teachers as well as health experts.

CHAPTER TWO

REVIEW OF LITERATURE

Diminishing Budget for Physical Education

As budgets become smaller and accountability focus remains on the areas of English and math, comprehensive physical education at the secondary level could be facing extinction. In her article, "Is the Extinction of High School Physical Education Inevitable", Doolittle (2007) asserts that "mandated high school physical education is disappearing fast, and the 2001 No Child Left Behind Act (NCLB) continues to pressure physical education and all non-tested subjects" (p. 7). In looking at this trend, Doolittle encourages the powers that be to find ways of motivating and increasing the accountability for physical education at high school (2007). It would seem obvious that physical education is vitally important to high school age adolescent students. In their article, "Physical Activity, Sports Participation, and Risk Factors in Adolscents", Boreham, Twisk, Savage, Cran and Strain (1997), state very clearly that

> a lifestyle parameter of major interest is physical activity, not only because it has been shown in adults

> to be closely related to [coronary heart disease] mortality, but also because of concerns recently expressed about perceived decline in overall activity and sports participation both in children and adults (p. 789).

This study implies that physical education is vitally important to our youth. In the current 2010 Shape of the Nation Report, it is clearly asserted that "quality physical education is an essential element in the formative growth of children and adolescents" and that "physical education is, in short, the best hope for the shape of our nation" (NAPSE, p. 1). Additionally, Clements (2010) in the article, "Ageless Considerations for the Ongoing Inclusion of Play, Recess and Physical Education", discusses how the implementation of President Obama's "Race to the Top" Initiative has also promoted the loss of regular physical education to our students. Clements cites Jonn Dewey, American Educator and proponent of constructivist learning, who says that play and active learning is important for cultivating important social habits that will extend throughout the life of the person. Interestingly PR Newswire published a story, "Shape of Nation Report; Most States Receive a Failing Grade on

Physical Education Requirements" which cited then NASPE President, Jacalyn Lund, stating, "state physical education requirements are extremely weak" (Lund, 2006, p. 1). It is clear that without accountability and motivation for its continued justified existence, it will fall to the wayside.

Online Physical Education

An answer to curriculum demands and shortened budget while still respecting the ever present need for appropriate physical education could be offering online physical education courses at the secondary level. In their article, "The Virtual Revolution: Understanding Online Schools", Greenway and Vanourek (2006) discuss the trend of online education as exciting and unchartered but definitely the next wave in incorporating all aspects of education into a student's day, especially at the high school level. In fact, the one drawback that they discuss lies in the ability to adapt to the needs of special learners such as those with visual impairments, limited English proficiency and/or disabilities (Greenway & Vanourek, 2006). These are all challenges that will be faced as this idea presses forward.

As the incidence of online education becomes more viable for K-12 completion course credits, the subject will have to be entertained and if appropriate, specific protocol will have to be decided for online physical education. In his article, "More Students Taking Physical Education Online", Weber (2009) asserts that in the state of Minnesota, the law is that physical education is a requirement but it remains in each individual school district's discretion as to how that credit is earned and accounted for in the student's records. This means that online physical education can be constructed at the will of the instructor and district guidelines. The case can be made in favor of and in opposition of online physical education as both sides to the argument present viable issues.

The National Association for Sport and Physical Education released a position paper entitled "Initial Guidelines for Online Physical Education" wherein, it is clearly evident that there are a variety of instructional practices being used to implement online physical education; however, there is not a clear consensus as to what is effective as far a monitoring student achievement in the subject area. In fact, the article states that

"there are no empirical studies in physical education comparing face-to-face learning with online approaches, but the need to initiate future research in this area exists" (NASPE, p. 1).

The importance of physical education, especially for youth has been highlighted in recent years. In the article, "The Case for Daily Physical Education: Concerns about Budget, Time and Staffing Can All Be Satisfied", Lynn (2007), asserts that 81 percent of adults and 71 percent of teens believe in daily physical education that is mandatory. She also discusses the important factor that physical education plays in the physical skills and fitness but also in the development of social interaction skills between students (Lynn, 2007). Additionally, Lynn (2007) also makes some important assertions regarding the childhood and adolescent obesity epidemic which has worsened dramatically over the past two decades and appears to be continuing the same direction unless physical activity and appropriate nutrition becomes a priority for students of all ages and grades (Lynn, 2007).

Ultimately, the war against unhealthy and obese adolescents is a strong weighing factor in the effectiveness of an online physical education class.

Crocker, Bailey, Faulkner, Kowalski and McGrath (1997) collaborated on a research study discussed in their article, "Measuring General Levels of Physical Activity: Preliminary Evidence for the Physical Activity Questionnaire for Older Children" which shows that the most common way that studies collect data on physical activity for adolescents is by using the "self-report" method. In the article, the idea that the "self-report" method is unreliable because it asks for adolescents to give information about the levels and effort in physical exercise that they may not be expert enough about to label correctly (Crocker et. al 1997). Based on the conclusions from the article, it can be concluded that unless students "self-report" accurately in an online physical education class, they may be doing detriment to themselves and their progress towards achieving an appropriate fitness level for their age and ability.

As the incidence of online physical education offerings have increased, there have been an increasing number of articles and opinion pieces written in support of the trend and just as many in opposition to the trend. The primary dissension between the two sides of the argument lies in the delivery of knowledge and information.

Conversely, there are success stories for individuals who have overcome socio-emotional issues and found achievement through the medium of online physical education. In her article, "Virtual P.E.? No Sweat! Well, Not Exactly", Grayson (2010) describes a student who shed an approximated forty pounds during the completion on her online course. In this particular situation, one can see the development of course criteria including an activity journal that must be confirmed by an outside coach or parent, creating a system of accountability for the physical activity piece (Grayson, 2010).

The focus for this study is to analyze whether or not online physical education gives instructors the ability to educate students in the best way possible. The intent of the study would be to prove that online physical education is either beneficial or is detrimental to the student achievement at the secondary level in the areas of physical fitness and health.

CHAPTER THREE

METHODOLOGY

Purpose Of The Project

The purpose of this project is to examine how online physical education courses impact student learning and achievement of fitness and health standards now that budget cuts are leading to the curtailing or elimination of traditional physical education classes at the secondary level of K-12 education. This study was analysis of current online physical education programs as well as those programs that include a virtual instruction format in addition to traditional instruction and the success and challenges that are faced by instructors in ensuring that student achievement is monitored at the same level that it would be if the class were taught in a traditional setting. The significance of the project is to offer an analysis that describes how physical education can be prioritized and valued in an online setting as the number of online secondary programs increase in coming years. Health and fitness will continue to be an issue in future and should still be an integral part of secondary education experiences.

Scope of the Project

This project is specified for instructors, administrators and students. The information analyzed can be used to adapt, modify and implement new or existing physical education programs in an online format. The gathered information from this project was obtained from academic journals and current media articles such as *Quarterly Review of Distance Education, MPRNEWS, College Student Journal, The Turkish Online Journal of Educational Technology, The Journal of Physical Education, Recreation and Dance, American Alliance for Health, Physical Education, Recreation and Dance* and *National Association for Sports and Physical Education.* The journal articles have been peer reviewed and have been published within the past decade.

Limitations of the Project

The limitation of this project lies in the relatively new existence of online physical education classes at comprehensive K-12 education programs. Additionally there are limitations in the selection of studies, the data and information on the internet and online practices. The internet is fairly recent technology and there may be

limited studies to research and receive data from. There have not been specific studies completed on sustained health and fitness success of students who been educated in the national standards for physical education while participating in an online class.

CHAPTER FOUR

PROBLEM

Existence of Online Physical Education

In an era of shrinking budgets at the K-12 secondary level, the rising existence of online courses at high schools is increasing. This includes the availability of online physical education classes, which has caused some debate among educators, especially those that believe that there is a loss of effective instruction in physical education when students take a class online. Shrinking budgets have forced as emphasis on core subject areas leaving the existence of formal physical education floundering.

Online courses are a viable alternative to traditional classroom settings for a number of courses including physical education. The idea of distance education raises serious concerns about the legitimacy of the individual work completed in those classes. For example, in the article, "In Light of the Editorial in February 2006 JOEPERD, Do Online Physical Education Courses Meet NASPE's Standards for Quality Physical Education", Wiseman, Malkinson, McCarthy and Crider (2006), examine personal

experiences with online physical education. Wiseman states clearly that "[i]n our present society, it seems that there is an overemphasis on trying to make things easier [and] online learning experiences can be easier for some topics, but not for the acquisition of optimum motor learning" (Wiseman, Malkinson, McCarthy & Crider, 2006, p. 56). In addition to the idea of simplifying a complicated subject, Crider also discusses the idea that online education could be a potentially powerful instructional tool if the ideas regarding what it looks like, how it is used and who controls the outcomes is effectively outlined (Wiseman et al., 2007). Ultimately, most online physical education is left at the discretion of the student who is responsible for documenting personal physical activity and completing written and bookwork assignments. The accountability piece relies on the honor system for students and their parents. In his article, "Online Physical Education: Wires and Lights in a Box", Buschner (2006), questions the validity of online physical education by asking the question

> What worldview are we sending others when advocating for [online physical education]? We have a nationwide obesity crisis, and many youths and adults are lacking appropriate levels of physical activity. If sitting in

> front of a computer develops cognitive understanding, will it catalyze one's need to start and sustain moderate to vigorous levels of physical activity? (2006, p. 4).

The electronic communication in online physical education will not enable the instructor to engage in immediate feedback and checking for understanding that is accurate or genuine while engaging in chat on the World Wide Web. The effectiveness of one on one communication will be lost. The question becomes: how will the instructor verify that the student on the other end of the computer is accurately recording and portraying physical activity at the proficient level required by most state and national physical education standards?

CHAPTER FIVE

RESULTS AND FINDINGS

Effects of Online Physical Education

In their article, "Online Health-Related Fitness Courses: A Wolf in Sheep's Clothing or a Solution to Some Common Problems?", Ransdell, Rice, Snelson and Decola (2008) detail key points in the curriculum issues related to online physical education. Most importantly, they made the assertion that younger learners are different than adult learners meaning that secondary adolescent learners may need more explicit instruction in technique and skill than an adult learner. This is an important caveat to consider when developing and implementing an online physical education class. It will be critical to pre-assess student skill level using specific criteria so that individual student needs are met similarly to the traditional classroom model. It is clear that the most dependable and assured method of teaching the skills development portion of physical education, such as a sport like tennis or basketball, lies in the ability to correct and give feedback in a timely manner in order to help the student quickly make changes, accelerating proficiency in

the skill. Important to also note is that in their study, "High School Students in the New Learning Environment: A Profile of Distance E-Learners", Kirby and Sharpe (2010) show that high school students, both male and female, have a significantly more positive attitude about school. This leads to the inevitable idea that students may become more positive about physical education in an online and independent form as opposed to the traditional classroom setting.

Course content is important in the design of the online learning experience. For physical education, this becomes even more important. In their article, "Using Webquests to Create Online Learning Opportunities in Physical Education: Are you Looking for an Innovative Means to Develop Students' Cognitive Domain without a Loss of Activity? Try Webquests.", Woods, Karp, Shimon and Jensen (2004) give numerous examples of how combining technology and internet based learning in the form of webquests invigorate student motivation. Webquests are defined as "structured, online learning activit[ies][that are] inquiry-based [and] require learners to interact with Internet resources (Woods Karp, Shimon & Jensen, 2004, p. 45). The idea of webquests in physical education aligns

itself with the results from a study completed by Mowling, Brock, Eiler and Rudisill (2004) documented in the article, "Student Motivation in Physical Education: Breaking Down Barriers; Student Motivation in Physical Education Typically Declines after the Early Years. Why? and What Can Be Done About it?" which summarizes that student motivation and interest is increased when classes contain specific learning targets, challenging activities and students are allowed to feel control over their own learning including the element of choice. Webquests meet the needs for those key points when constructing curriculum in an online course (Woods et al., 2004).

Students surveyed in a Turkish study, "Perceptions of Students on the Application of Distance Education in Physical Education Lesson" by Yaman (2009), shows that student receptiveness to online physical education is positive; however, the one area that is regarded difficult is the ability to get immediate corrective feedback on application of ideas. Yamen (2009) states

> [t]he majority of students think that theoretical lesson would be given by distance education if appropriate software and tools are used [and] on the other hand, they generally think that in the physical

education field, compensation of failures on time is very important in practical lessons (p. 1313), meaning that students would like to have ideas and instructional materials presented through a virtual experience but have the opportunity to show their knowledge of skills in person to an instructor. Ultimately, as showcased by Podoll and Randle (2005)in their study, "Building a Virtual High School...Click by Click: South Dakota's Rapid City Academy Finds out Just What it Takes to Provide a Diverse Population of Students the Flexibility by Online Learning", students enjoy the freedom of choice of activity and choice of time which acts a motivator. In the survey noted in the study, students appreciated most the freedom of choosing when to work on class work and activities (Podoll & Randle, 2005).

As students work to self-motivate in online classes, there are many tools that are becoming available for instructors in order to meet the demands of student interest. For example, Mohnsen (2003), discusses virtual programs for physical education in the article, "Virtual Reality Applications in Physical Education", which are similar to technology pieces used to create games such a Nintendo's Wii Fit game. Mohnsen (2003) asserts that

"virtual reality systems hold great potential as a teaching tool and motivator in physical education classes [because] [t]hey offer people who are unlikely to participate in physical activity with opportunities to learn" (p. 14).

Effects of Monitoring Physical Activity

The most critical aspect of ensuring success for online physical education seems to lie in the presence of specific learning targets, assignments and accountability. Ullman (2006) cites teacher, Jan Braaten, in her article, "Minneapolis Scores with Online Physical Education Course" who shares that the combination of journaling activities and requiring a parent or coach signature to signal the completion of physical activity has increased student participation and interest in physical fitness. The coordinator for Braaten's high school, Renee Jesness shares "'we've had the highest success rate of students completing this course' and that students say that the self-monitoring and ability to know where to find the knowledge about fitness is crucial" (Ullman, 2006, para. 6). Similarly, Block (2004), in the article, "Profile: Online Physical Education Courses in Florida", showcases the response of seventeen year old student, Cara Chesal. Chesal

participates in an online physical education course so that she can maintain other advanced placement and honors classes at her high school. The online physical education class requires her to log one and a half hours a week of physical activity of their choice. They must keep a detailed log of their activity and have it signed by a parent (Block, 2004). The instructor of Chesal's class, Jo Wagner, stated clearly,

> every physical education teacher that I have talked with is skeptical. And to be real honest with you, I was skeptical about how it worked. However, once I saw the checks-and-balances system and the quality of assignments that the kids have to do and the active engagement--they have to participate in the class (Block, 2004, para. 8).

NASPE's position regarding the use of online physical education is documented in a position statement entitled, "Appropriate Use of Instructional Technology in Physical Education" (2009). According to NASPE, "online learning in physical education using hybrid or blended models, can provide valuable web-based supplemental content through online assignments, readings, chat rooms and examinations, coupled with face-to-face, activity based sessions" is the

acceptable format to be used (2009). Additionally, NASPE also asserts that online courses should include teacher-student interaction that is designed to give specific feedback (2009).

CHAPTER SIX

RECOMMENDATIONS

Suggestions for Implementation

The ease of accessibility of online courses and the increase issues with budget concerns imply that the desire to shift to online physical education, regardless of the concerns about effectiveness, is not going to change. In fact, the interest in proper implementation looks to be growing. Therefore, it is imperative to choose appropriate methods for implementation of criteria. The National Association for Sport and Physical Education (NASPE) published a position paper in 2007 that outlined specific criteria for an online physical education program. The criteria includes the following key ideas: requiring students to have passed a basic physical skills test prior to enrolling, requiring knowledge of internet and word processing, requiring students to demonstrate understanding of safety as well as demonstrating good time management and a contract for students and parents to observe when documenting physical activity (NASPE, 2007). Concurrently, NASPE also documented ideas for appropriate curriculum including the use of research-based instruction that is

aligned to the state and national standards, engaging instructional strategies that are decided to challenge and extend student learning, lessons that promote social growth and partnerships and the inclusion of formative and summative assessments (NASPE 2007).

It is clear from research that freedom of choice and self-monitoring of physical ability and strength is a motivator for students and has contributed to success of online or technology based physical education programs. The path on online physical education must follow the path of specific learning targets and student accountability systems built into the course.

Ultimately, if an online physical education program is designed in such a way that students are engaged and held accountable to monitoring their growth and meeting learning goals, the student will find success. A well-structured and interactive online physical education program has the potential to reach student populations who shy away from group activities and sports in regular physical education settings.

CHAPTER SEVEN

CONCLUSION

Summary of Findings

Due to budget constraints and an increased need for intervention in core subject areas such as reading and math, physical education runs the risk of being cut, reduced or eliminated despite a growing need to combat obesity among our adolescent students. Online physical education is a viable alternative for students and instructors who still strive to meet national and state standards of physical education. The recommendations made regarding structured accountability, formative assessments throughout the course and the use of engaging instructional strategies make implementation of an online physical education course possible for many schools.

The presence of technologically centered students is not going to fade; it is only going to increase over time. Utilizing this trait among students will work to the advantage of educators.

REFERENCES

Block, M. (2004). Profile: Online physical education courses in Florida. NPR All Things Considered. *National Public Radio.*

Boreham, C., Twisk, J., Savage, M., & Cran, J. (1997). Physical activity, sports, participation, and risk factors in adolescents. *Medicine and Science in Sports and Exercise. 29, 788-793.*

Buschner, C. (2006). Online physical education: wires and lights in a box. *The Journal of Physical Education, Recreation and Dance. 77, 3-7.*

Clements, R. (2010). Ageless considerations for the ongoing inclusion of play, recess and physical education. *Journal of Physical Education, Recreation and Dance. 81, 7-11.*

Crocker, P., Bailey, D., Faulkner, R., Kowalski, K. & McGrath, R. (1997). Measuring general levels of physical activity: preliminary evidence for the physical activity questionnaire for older children. *Medicine and Science in Sports and Exercise.* 29, 1344-1349.

Doolitle, S. (2007). Is the extinction of high school physical education inevitable? *Journal of Physical Education, Recreation and Dance.* 78, 7-11.

Grayson, J. (2010). Virtual p.e.? No sweat! Well, not exactly. Students still have to put in the laps, but for those with body-image issues or hefty course loads, taking gym class online is a welcome alternative that educators hope can spur a permanent interest in fitness. *THE Journal.* 37, 28-32.

Greenway, R. & Vanourek, G. (2006). The virtual revolution: understanding online schools. *Education Next.* 6, 34-41.

Hayward, L.(2003). When technology bites back: a case report describing and instructor's experience with online teaching. *Journal of Physical Therapy Education.* 17, 48-58.

Hurley, R. (2002). Fine-tuning an online high school to benefit at-risk students. *THE Journal.* 30, 33-43.

Kirby, D. & Sharpe, D. (2010). High school students in the new learning environment: a profile of distance e-learners. *The Turkish Online Journal of Educational Technology.* 9, 83-88.

Lynn, S.(2007). The case for daily physical education: concerns about budget, time and staffing can all be satisfied. *The Journal of Physical Education, Recreation and Dance*. 78, 18-22.

Mitchell, R. (2009). Online education and organizational change. *Community College Review*. 37, 81-94.

Mohnsen, B. (2003). Virtual reality applications in physical education. *The Journal of Physical Education, Recreation and Dance*. 74, 13-19.

Mowling, C., Brock, S., Eiler, K. & Rudisell, M. (2004). Student motivation in physical education: breaking down barriers; student motivation typically declines after the early years. why? and what can be done about it? *The Journal of Physical Education, Recreation and Dance*. 75, 40-49.

National Association for Sport and Physical Education. (2007). *Initial guidelines for online physical education*. Reston, VA.

National Association for Sport and Physical Education. (2009). *Appropriate use of instructional technology in physical education*. Reston, VA.

Picciano, A. (2006). Online learning: implications for higher education pedagogy and policy. *Journal of Thought*. 41, 75-80.

Podoll, S. & Randle, D. (2005). Building a virtual high school...click by click: South Dakota's rapid city academy finds out just what it takes to provide diverse population of students the flexibility offered by online learning. *THE Journal*. 33, 14-18.

PR Newswire Association LLC. 2006. Shape of the Nation Report; Most States Receive a Failing Grade on Physical Education Requirements. *PR Newswire*.

Ransdell, L., Rice, K., Snelson, C. & Decola, J. (2008). online health-related fitness courses: A wolf in sheep's clothing or a solution to some common problems? As the demand for online education rises, so does the need for innovative strategies for delivering health-related fitness courses. *The Journal of Physical Education, Recreation and Dance*. 79, 45-55.

Ronsisvalle, T. & Watkins, R. (2005). Student success in online K-12 education. *Quarterly Review of Distance Education*. 6, 117-123.

Ullman, E. (2006). Minneapolis scores with online physical education course. *District Administration*. Retrieved

from http://www.thefreelibrary.com/Minneapolis+scores+with+online+physical+education+course-a0141091289

Weber, T. (2009). More students taking physical education online. MPRNEWS. Retrieved from http://minnesota.publicradio.org/display/web/2009/08/25/online-physical education/

Wiseman, D., Malkinson, B., McCarthy, H. & Crider,D.(2006). In light of the editorial in the February 2006 JOPERD, do online physical education courses meet NASPE's standards for quality physical education? *The Journal of Physical Education, Recreation and Dance.* 77, 55-56.

Woods, M., Karp, G., Shimon, J. & Jensen, K. (2004). Using webquests to create online learning opportunities in physical education: are you looking for an innovative means to develop students' cognitive domain without a loss of activity time? try webquests. *The Journal of Physical Education, Recreation and Dance.* 75, 45-50.

Yamen, M. (2009). Perceptions of students on the application of distance education in physical education lessons. *The Turkish Online Journal of Educational Technology.* 8, 1303-1313.